UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mineral investigation of the Whetstone Roadless Area, Cochise and Pima Counties, Arizona

U.S. Bureau of Mines Mineral Land Assessment
MLA 129-82
1982

By
McColly, R.A. and Scott, D.C.

This open file report summarizes the results of a Bureau of Mines wilderness study and will be incorporated in a joint report with the U.S. Geological Survey. The report is preliminary and has not been edited or reviewed for conformity with the U.S. Bureau of Mines editorial standards. Work on this study was conduced by personnel from Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, CO 80225.

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FOREWORD

The U.S. Bureau of Mines and U.S. Geological Survey jointly conduct mineral surveys of lands which in the U.S. Forest Service Second Roadless Area Review and Evaluation (RARE II) program have been designated for further planning. These evaluations are used in the RARE II program, which conforms with the Multiple-Use Sustained-Yield Act of 1960 (74 Stat. 215; 16 U.S.C. 528-531), the Forest and Rangeland Renewable Resources Planning Act of 1974 (88 Stat. 476, as amended; 16 U.S.C. 1601 note), and the National Forest Management Act of 1976 (90 Stat. 2949; 16 U.S.C. 1600 note). Reports on these surveys provide the President, Congress, the U.S. Forest Service, and the general public with information essential for determining the suitability of land for inclusion in the National Forest Preservation System.

This report is on the Whetstone RARE II Roadless Area (3-120), Cochise and Pima Counties, Arizona.

CONTENTS

ILLUSTRATIONS

TABLES

MINERAL INVESTIGATION OF THE WHETSTONE ROADLESS AREA, COCHISE AND PIMA COUNTIES, ARIZONA

By Robert A. McColly and David C. Scott, U.S. Bureau of Mines

INTRODUCTION

Field examination of the Whetstone Roadless Area, as part of a joint mineral survey made with the U.S. Geological Survey, was begun by the U.S. Bureau of Mines in September 1980 and concluded in October 1980. A search for recorded mining claim locations, assessment work filings, and other pertinent information was made at the Cochise and Pima County Courthouses. A list of active mining claims and mineral leases filed with the U.S. Bureau of Land Management was also obtained.

Field studies included reconnaissance of all mines, prospects, and mineralized areas inside, or within a mile of, the roadless area boundary. Accessible mine workings were mapped by the Brunton-and-tape method, and 42 samples were taken for analysis (table 2, and figs. 2-6). Several samples were analyzed spectrographically for 42 elements and 12 were fire-assayed for gold and silver. Additional analyses were made when other minerals of economic interest were seen or suspected. Most of the assay data pertaining to economic minerals are in table 2. The results of all analyses are available for public inspection at the Bureau of Mines, Intermountain Field Operations Center, Denver Federal Center, Denver, Colorado 80225.

Location, size, and geographic setting

The Whetstone Roadless Area (fig. 1) comprises 36,610 acres of the Whetstone Mountains area in Cochise and Pima Counties, Arizona. The area is entirely within in the Coronado National Forest and is located about 6 mi southwest of Benson, Arizona.

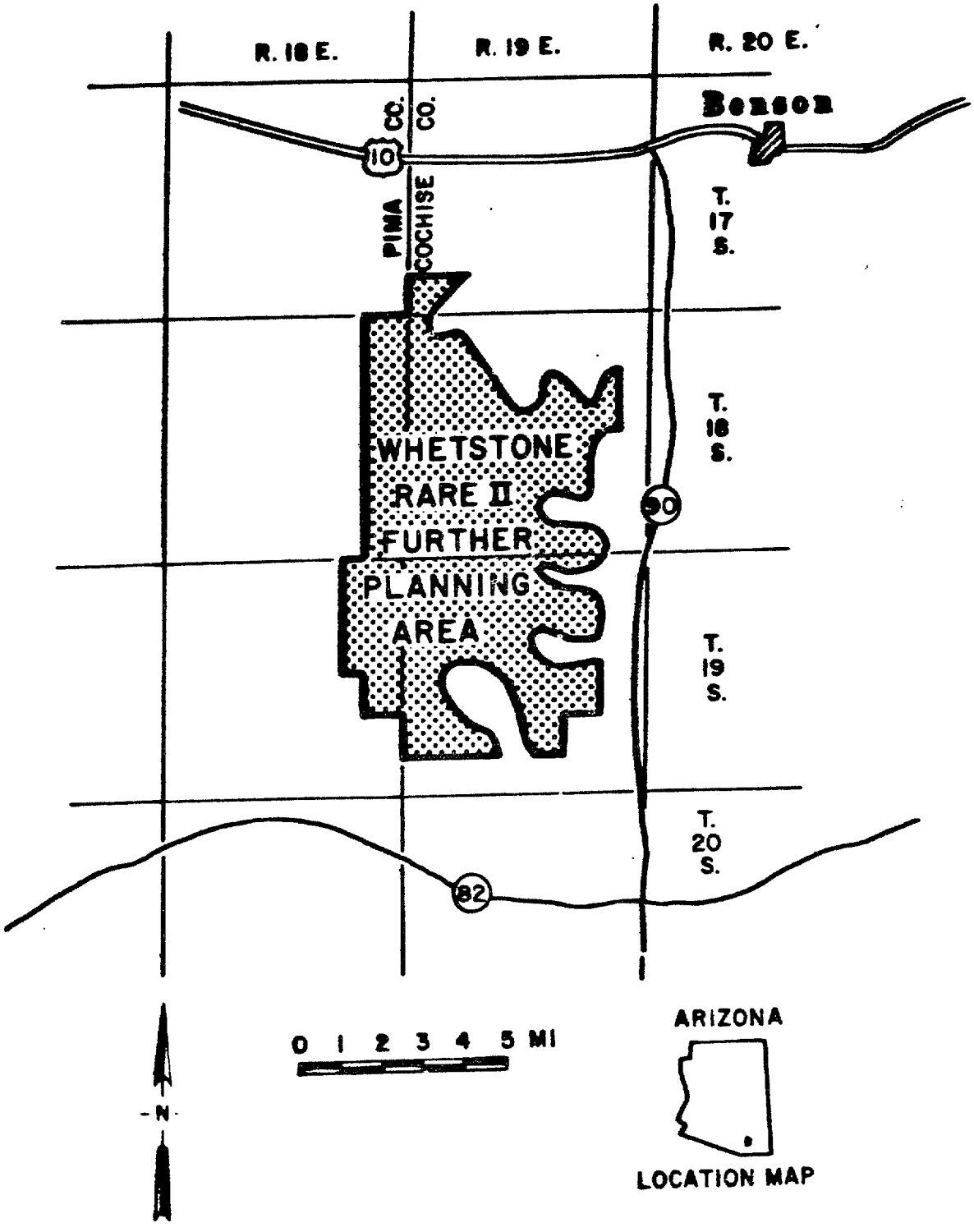

Figure 1.-Index map of Whetstone Roadless Area, Cochise and Pima Counties, Arizona.

The Whetstone Mountains are a north-oriented range where sedimentary rocks are exposed in a simple monocline. Dipping to the west, these sedimentary rocks produce steep and rocky ridges on the eastern side of the range. Elevations on the eastern side of the mountains range from 4,800 ft at the base to 7,711 ft on Apache Peak. Topography is rough and mountainous.

Forest Service roads, mine roads, and jeep trails provide access to the perimeter of the area from Interstate Highway I-10, and Arizona Highways 82 and 90 (fig. 1). Only along the west side is the area boundary more than 4 or 5 mi from a paved road. In the interior of the roadless area access is difficult, owing to rugged terrain and the absence of trails.

Mining activity

About 1870, small copper-gold-silver deposits (Nevada-Mascot and Two Peaks Mines) were discovered in the Mine Canyon area (pl. 1). For many years production was unrecorded, but intermittent mining, prospecting, and exploration have continued to the present.

Mineral production from within the roadless area was limited to copper, silica, and minor silver at the Copper Plate Mine (Keith, 1974, p. 145), and tungsten at the James Mine (Keith, 1973, p. 91). Elsewhere, claims and parts of claims, some with prospect pits or other small workings, are found within the roadless area, but none of these show evidence of production.

At the Copper Plate Mine, (table 1) sandstone was mined and used for smelter flux during the 1950's.

Mining activity outside the roadless area but close enough to require examination of the properties involved included those near Middle and Guindani Canyons along the eastern boundary of the roadless area. These properties produced fluorite, quartz, tungsten, and uranium. Most of these mines were

active during the 1950's and earlier. No recent activity is known for any of them. Tungsten mining was recorded as early as 1905 or 1906 (Hess, 1909, p. 164), and minor production was intermittent until the late 1950's when it ceased (Dale and others, 1960, p. 53-57).

From 1946 to the late 1960's fluorite was mined at the Lone Star vein deposit at the mouth of Middle Canyon. Silica was produced for smelter flux at the Ricketts Mine during the 1950's (table 1). Small amounts of uranium were produced at the Star No. 1 (Bluestone) Mine (table 1).

Exploration for uranium occurred during the early 1950's along Cottonwood Canyon and at sites north of the roadless area. Only one or two properties produced any ore. In 1980, claims filed by Kerr-McGee and Rocky Mountain Energy Corporations covered most of an exposed stock and surrounded the older uranium prospects.

In June 1982, leases for oil and gas had been issued for all public lands in the Whetstone Roadless Area by the Bureau of Land Management. No test drilling had taken place, and no oil or gas has been produced from either Cochise or Pima Counties.

No other type of Federal mineral leasing has occurred within the roadless area.

MINING DISTRICTS AND MINERALIZED AREAS

The Whetstone mining district encompasses the Whetstone Mountains and includes the entire roadless area. In this report the district is geographically divided into four mineralized areas: the Mine Canyon area, the Copper Plate Mine area, the Middle and Guindani Canyons area, and the Cottonwood Canyon area. Elsing and Heineman (1936, p. 91) cited production from the Whetstone mining district for the period 1918-1929 as 100,000 pounds of copper, 900,000 pounds of lead, and $30,000 in silver.

Mine Canyon area

Mine Canyon is in the south-central part of the roadless area; most of the mines and prospects are in unsurveyed sec. 20 and 21, T. 19 S., R. 19 E. Two patented lode claims, the Nevada (fig. 2) and the Mascot (fig. 3), are located outside the area in unsurveyed sec. 20, but are surrounded by almost 100 unpatented claims, some extending into the roadless area. Two Peaks Mine (fig. 5) workings are also located outside the roadless area.

Copper, gold, and silver are found disseminated in the quartz veins and shear zones, as disseminations along seams and fractures in Laramide porphyry dikes, and as pyrometasomatic lenses near contacts with limestones of the Cretaceous Bisbee(?) Formation (Creasey, 1967) and the Pennsylvanian-Permian Naco Group (Keith, 1973, p. 91). Adits, shafts, open cuts, and shallow pits explore shear zones and quartz veins in a Laramide age granodiorite stock (Creasey, 1967).

Total production for individual properties is not known, but 36,048 lbs of copper, 8 oz of gold, and 611 oz of silver were produced between 1955 and 1961 from the Nevada-Mascot, Two Peaks, and other small mines in the Mine Canyon area (U.S. Bureau of Mines, Mineral Information Locator System, (MILS), 1955-1961 data files, Intermountain Field Operations Center, Denver Federal Center, Denver, CO 80225).

DeRuyter (1979, p. 109-111) calculated an indicated resource of 29 million metric tons of approximately 0.3 percent copper and 0.01 percent molybdenum from 4,400 ft of assayed drill core from five drill holes 1,000 to 1,500 ft south of the Nevada-Mascot workings. This resource is in Mine Canyon, but outside the roadless area. Based on DeRuyter's geologic sections, the quartz monzonite porphyry host rock projects into the roadless area at a depth of about 2,500 ft. This, however, is unconfirmed by drilling.

Copper Plate Mine area

The Copper Plate Mine, in the central part of sec. 24, T. 19 S., R. 18 E., consists of an irregular 70-ft long open pit, approximately 30- to 50-ft wide and 15- to 30-ft deep, which exposes a 6- to 9-ft-wide fault zone containing copper carbonates and oxides of iron and manganese (table 2, sample 40). The fault cannot be traced beyond the pit limits.

Copper carbonates occur as pervasive staining in the host sandstone and as coatings and fillings along fractures and bedding planes. The host rock, mapped by Creasey (1967), is Cretaceous Bisbee(?) Formation sandstone, shale, and marl. Some production from the mine was recorded (table 1).

Bureau of Mines sample 40 (table 2) represents the strongest remaining copper showing in the pit. At 0.68 percent copper, it is about half of the mine-run value reported by Keith (1974, p. 145; table 1). The copper content across the entire mineralized zone averages significantly less. Even so, a 2,000- to 4,000-ton resource of low-grade copper is possible, assuming an average cross section equal to that exposed on the north wall of the pit, and a northward projection of 50 to 100 ft.

A similar, but smaller copper occurrence (table 2, sample 42) is at a prospect 2.5 mi northwest of the Copper Plate Mine in the northwest corner of sec. 15, T. 19 S., R. 18 E. In the main working, a 3-ft-wide copper-stained zone, striking southwest and dipping 45° south, was explored down-dip by a 30-ft inclined shaft. Small shipments may have been made but most of the extracted material remains on the dump. The mineral occurrence probably was too localized to permit profitable mining. No sulfide minerals were observed at either site.

A third prospect pit was found in Bisbee(?) Formation rocks (Creasey, 1967) about 1.5 mi north of the Copper Plate Mine, in the northern part of

sec. 13, T. 19 S., R. 18 E. A black, shaly unit is poorly exposed for more than 100 ft along a hillside. Soil conceals much of the outcrop, but the unit appears to be at least 10-ft thick. No evidence of mineralization was found at the site or from analysis of the material (table 2, sample 41), but because of the appearance of the outcrop, the prospectors may have thought they had discovered coal.

Middle and Guindani Canyons area

Fluorite, quartz, tungsten, uranium, and possibly gold have been produced from the Middle and Guindani Canyons area on the east side of the Whetstone Mountains. Several tungsten properties are known, but only the James Mine within the roadless area has recorded production. Each of the other mineral occurrences is found in a single separate deposit; fluorite at the Lone Star Mine (table 1), gold at the Gold Crystal prospect (tables 1, 2, samples 16, 17), quartz at the Ricketts Mine (tables 1, 2, samples 4, 5), and uranium at the Star No. 1 (Bluestone) Mine (tables 1, 2, samples 6-10).

The Lone Star Mine, in Middle Canyon, is believed to have been the largest single fluorite producer in Arizona (Elevatorski, 1971, p. 10); most of the production came between 1946 and 1967 (Keith, 1973, p. 91). At the time of Burnette's visit (1957, p. 25-26) an inclined shaft connected levels at 60, 90, 190, 250, and 300 ft below the surface, but the 60- and 90-ft levels were caved together and the 300-ft level was flooded. In 1980, the headframe had been demolished and the shaft opening bulldozed over. Small fragments of fluorite on the dump and a few remnants in an open trench (or caved stope) north of the shaft were all of the vein that was accessible.

Burnette (1957, p. 25-26) stated that the vein, in Pinal Schist, averaged 2-ft wide in the Lone Star Mine, pinched out 50 ft south of the shaft, and is associated with a Precambrian granite stock north of the mine. The

stock was mapped by Creasey (1967) as alaskite. Mine-run ore was high grade, between 75 and 85 percent CaF_2, coarse grained, crystalline, usually pale green to white, and occurred in ore shoots averaging 2.5-ft wide, 25-ft long, and 35-ft high, dipping 80° south (Elevatorski, 1971, p. 10). All ore production was from this single vein (table 1).

The Gold Crystal Mine is 2 mi west of the Lone Star Mine, between Middle and Guindani Canyons and about 200 ft outside the roadless area. A trench was dug on a fault contact between Precambrian Bolsa Quartzite and Abrigo Limestone (Creasey, 1967) (fig. 6). The fault strikes N. 20° E., and dips 47° SW. Iron-stained fault breccia and gouge form the 2-ft-wide gold bearing zone which is exposed by a 15-ft wide, 200 ft long trench on the surface. The trench varies in depth from 15 to 25 ft. The vein does not appear to extend into the roadless area.

At the Ricketts Mine (tables 1, 2, samples 4, 5), quartz was produced during the 1950's from four claims patented by the Phelps Dodge Corporation in 1923. This quartz was used for flux at Phelps Dodge's Douglas smelter. The mine is near the eastern end of a massive deposit of Precambrian bull quartz that is more than a mile in length and which extends about 800 ft into the roadless area (Creasey, 1967). On the basis of the geologic map (Creasey, 1967) the unit is exposed in the roadless area as an outcrop having a surface area of approximately 100 by 800 ft. This surface area is less than 5 percent of the total exposure but represents a resource of 5,000 to 6,000 tons of quartz for each vertical foot the deposit extends beneath the outcrop area. Bureau of Mines samples showed no metallic mineral values in the quartz (table 2, samples 4, 5). The property was inactive in 1980.

Beginning in the early 1900's, tungsten was produced sporadically from the Chadwick and James Mines in an area between Middle and Guindani Canyons

(Hess, 1909, p. 164). Most of the tungsten came from small, shallow workings on the Chadwick (tables 1, 2, sample 12) property outside the roadless area, though the James Mine within the area has recorded production also (tables 1, 2, samples 13-15). Workings at the James and Chadwick Mines consist of short adits and scattered prospect pits that explore quartz veins in alaskite near an alaskite-schist contact (Creasey, 1967). Disseminated scheelite and wolframite occur in the quartz veins and in the alaskite along the contact.

Two of the ten samples taken by the U.S. Bureau of Mines from these workings assayed above the 0.01-percent detection limit for tungsten, and both (table 2, samples 14, 15) were from the main open cut at the James Mine. One was a 6-in. quartz-vein sample that assayed 0.25 percent tungsten and the other a 24-in. chip sample across a shear zone that assayed 0.06 percent tungsten.

The total tungsten production for the district was estimated by Dale, Stewart, and McKinney (1960, p. 54) as not exceeding 1,000 units of WO_3. They also stated, "There is no measurable ore in the mines today. The indicated reserves are small and inferred reserves probably will not exceed 1,000 tons of ore at 0.5 percent WO_3."

At the Star No. 1 (Bluestone) Mine, production of low-grade uranium ore (tables 1, 2, samples 6-10) was reported by Keith (1973). Mine workings explored the contacts between mafic dikes and Precambrian alaskite (Creasey, 1967). Two northwest-trending dikes about 15 ft apart are exposed, the westernmost about 4 ft thick, the other about 2 ft. No uranium minerals were identified at the sample sites, but Keith (1973, p. 91) stated that autunite, tyuyamunite, and possibly other secondary uranium minerals are present. Assay values obtained ranged from 0.020 to 0.024 percent U_3O_8

(table 2, samples 9, 10). There is no evidence that the dikes extend into the roadless area.

Cottonwood Canyon area

Cottonwood Canyon lies approximately in the center of a Precambrian quartz monzonite stock that underlies at least 20 sq mi of the northern Whetstone Mountains (Creasey, 1967). During the 1950's, several mining claims over radiometric anomalies in the area were filed. All the prospect workings (tables 1, 2, samples 1-3) examined were along quartz veins, shears, faults, or dikes in this stock.

Several prospects gave scintillometer readings in the range 200-400 cps (counts per second). A high reading of 800 cps (above a background of 20 cps) was made from dump material near a caved shaft in sec. 10, T. 18 S., R. 19 E. Production from these prospects consisted at most of a few tons of low-grade uranium ore. During the late 1970's, the Kerr-McGee and Rocky Mountain Energy Corporations filed 579 mining claims, which cover most of the outcrop area of the stock. Both companies initiated drilling programs to test faults and shears in the stock for uranium concentrations near the present water table (Scarborough, 1981, p. 86-87). No drilling results were made available to the Bureau of Mines, and there are no data on which to base reserve or resource estimates.

CONCLUSIONS

In summary, the most significant mineral occurrences in the Whetstone Mountains are located outside the boundaries of the roadless area. The Whetstone roadless area has yielded minor tungsten production from the James Mine and silica with copper and silver values from the Copper Plate Mine. Additional silica resources at the Copper Plate and Ricketts Mines were shown by this study. No other mineral deposits are known within the area.

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Table 1. -- Summary of information derived from U.S. Bureau of Mines examination of known mineral deposits in and near the Whetstone Roadless Area, Cochise and Pima Counties, Arizona.

Deposit (sample no.)[1/]	Location	Commodity	Geologic Control	Production and Development
Nevada-Mascot Mines (19-28, 33-39).	Sec. 20, T. 19 S., R. 19 E.	Copper, gold, silver.	Copper, gold, and silver occur disseminated in fault zones and quartz veins in a grano-diorite stock.	Total production unknown (refer to text). Mascot adit 500 ft long, Nevada adit 250 ft long, shallow shafts, several prospect pits.
Two Peaks Mine (29-32).	Sec. 20 T. 19 S., R. 19 E.	Copper, gold, silver	Copper, gold, and silver occur disseminated in fault zones and quartz veins in a grano-diorite stock.	Production unknown. Adit 250 ft long, adit 40 ft long, 40 ft shaft and several prospect pits.
Copper Plate Mine (40).	Sec. 24, T. 19 S., R. 18 E.	Copper, silver	Copper carbonates and silver localized in fault zone within sandstone unit.	1,600 tons of ore averaging 1.2 percent copper, 0.6 oz silver per ton produced in 1957-58 (Keith, 1974, p. 145). 70-ft long 30 ft deep open pit.
Gold Crystal Mine (16, 17).	Sec. 27, T. 18 S., R. 19 E.	Gold	Gold occurs in gouge and breccia along a fault contact between limestone and quartzite.	Production unknown. 200-ft trench, caved adit.
James Mine (13-15).	Sec. 26, T. 18 S., R. 19 E.	Tungsten	Scheelite and wolframite occur disseminated in quartz veins in alaskite.	Several hundred pounds of concentrates produced from sorted ore assaying more than 2.0 percent WO_3 (Dale, and others, 1960, p. 55-56). Trench 75 ft long, several prospect pits.

Table 1. -- Summary of information derived from U.S. Bureau of Mines examination of known mineral deposits in and near the Whetstone Roadless Area, Cochise and Pima Counties, Arizona.-Continued

Deposit (sample no.) [1]	Location	Commodity	Geologic Control	Production and Development
Lone Star Mine	Sec. 35, T. 18 S., R. 19 E.	Fluorite	Fluorite occurs in a vein in schist.	20,000 tons of fluorite produced from 1946 to 1967 (Keith, 1973, p. 91). Caved shaft and several trenches on strike of the vein, several prospect pits.
Star No. 1 Mine (Bluestone) (6-10).	Sec. 26, T. 18 S., R. 19 E.	Uranium	Uranium occurs along mafic dikes in alaskite.	About 47 tons of low-grade uranium ore produced in 1958-60 (Keith, 1973, p. 91). Four short adits, scattered prospect pits.
Chadwick Mine (12).	Sec. 25, T. 18 S., R. 19 E.	Tungsten	Scheelite and wolframite occur disseminated in quartz veins in alaskite.	60-80 units (1,200-1,600 lbs.) of WO_3 were produced (Wilson, 1950, p. 9-10). 100-ft trench, several prospect pits.
Ricketts Mine (4, 5)	Sec. 24, T. 18 S., R. 19 E.	Silica	Quartz veins along contact between alaskite and quartz monzonite.	Several tens of thousands of tons of silica from 1955 to 1959 (Keith, 1973). Several open pits and prospects.
Cottonwood Canyon Area (1-3).	Sec. 3, 4, 9, 10, 15, 16, T. 18 S., R. 19 E.	Uranium	Uranium occurs in fault zones, dikes, and quartz veins in quartz monzonite stock.	Production unknown. Scattered shallow shafts, prospect pits.

[1] Samples 18, 41, and 42 not listed. Sample 18 taken at caved shaft in Dry Canyon, east of Nevada-Mascot Mines. Sample 41, taken 1-1/2 miles north of Copper Plate Mine; sample 42 taken from caved shaft outside RARE II, about 2.5 miles northwest of Copper Plate Mine.

Table 2. -- Results of analyses of samples not shown on seperate mine maps.

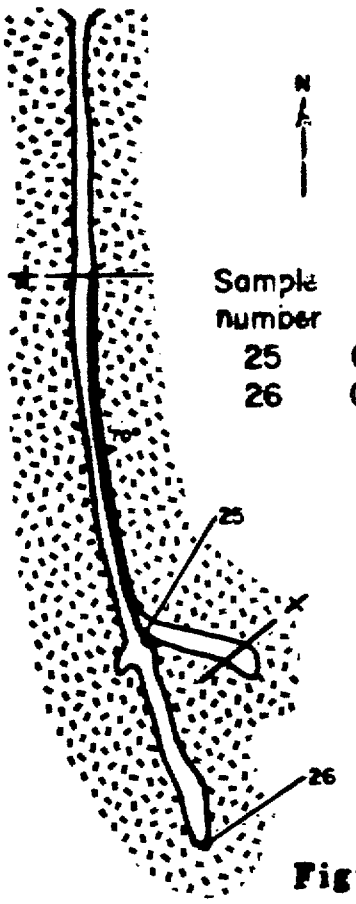
[Gold and silver determined by fire assay; copper, lead, and zinc determined by spectrographic analysis; uranium determined by fluorometric analysis. Spectrographic analysis results are available for public inspection at the U.S. Bureau of Mines, Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, Colorado 80225. -, assayed for, but below detection limits; NA - not assayed for. Detection limit for gold, 0.005 oz/ton; silver, 0.2 o./ton; tungsten, 0.01 percent; uranium, 0.002 percent. Dump samples were taken on a grid system over the dump at a depth of 0.3 to 1.0 foot below the dump surface.]

Sample			Gold	Silver	Copper	Lead	Tungsten	Uranium
No.	Type	Description	oz/ton		percent			
1	Dump	Shaft	NA	NA	NA	0.06	-	-
2	Dump	Caved shaft	NA	NA	NA	NA	NA	0.036
3	Dump	Shaft	NA	NA	NA	NA	NA	.083
4	48 in. chip	Pit	-	-	-	-	-	-
5	Dump	Pit	-	-	-	-	-	-
6	6 in. chip	Pit	NA	NA	NA	NA	0.01	NA
7	40 in. chip	Adit	NA	NA	NA	NA	-	NA
8	40 in. chip	Adit	NA	NA	NA	NA	-	NA
9	50 in. chip	Adit	NA	NA	NA	NA	NA	.020
10	36 in. chip	Adit	NA	NA	NA	NA	-	.024
11	36 in. chip	Pit	NA	NA	NA	NA	-	NA
12	12 in. chip	Pit	NA	NA	NA	NA	-	NA
13	30 in. chip	Pit	-	0.2	NA	NA	-	NA
14	6 in. chip	Pit	-	.2	NA	NA	.25	NA

Table 2. -- Results of analyses of samples not shown on seperate mine maps.-Continued

Sample No.	Sample Type	Sample Description	Gold	Silver	Copper	Lead	Tungsten	Uranium
			oz/ton		percent			
15	24 in. chip	Pit	NA	NA	NA	NA	.06	NA
18	Dump	Caved shaft	NA	NA	NA	NA	NA	NA
19	14 in. chip	Pit	-	.2	NA	NA	NA	NA
20	Dump	Shaft	-	2.4	NA	NA	NA	NA
21	12 in. chip	Adit	NA	NA	NA	NA	NA	NA
22	48 in. chip	Pit	-	.2	0.44	NA	NA	NA
27	6 in. chip	Pit	-	.4	1.28	NA	NA	NA
28	8 in. chip	Adit	-	.4	.41	NA	NA	NA
38	36 in. chip	Pit	-	.2	.82	.02	NA	NA
39	30 in. chip	Pit	-	.2	NA	NA	NA	NA
40	108 in. chip	Pit	-	.6	.68	NA	NA	NA
41	Dump	Pit	-	-	NA	NA	NA	NA
42	Dump	Shaft	-	.8	1.4	.07	NA	NA

NEVADA MINE



Sample number	Sample type/width	Au oz/ton	Ag oz/ton	Cu %
25	Chip-72 in.	—	0.2	0.45
26	Chip-24 in.	—	.2	.02

Figure 2

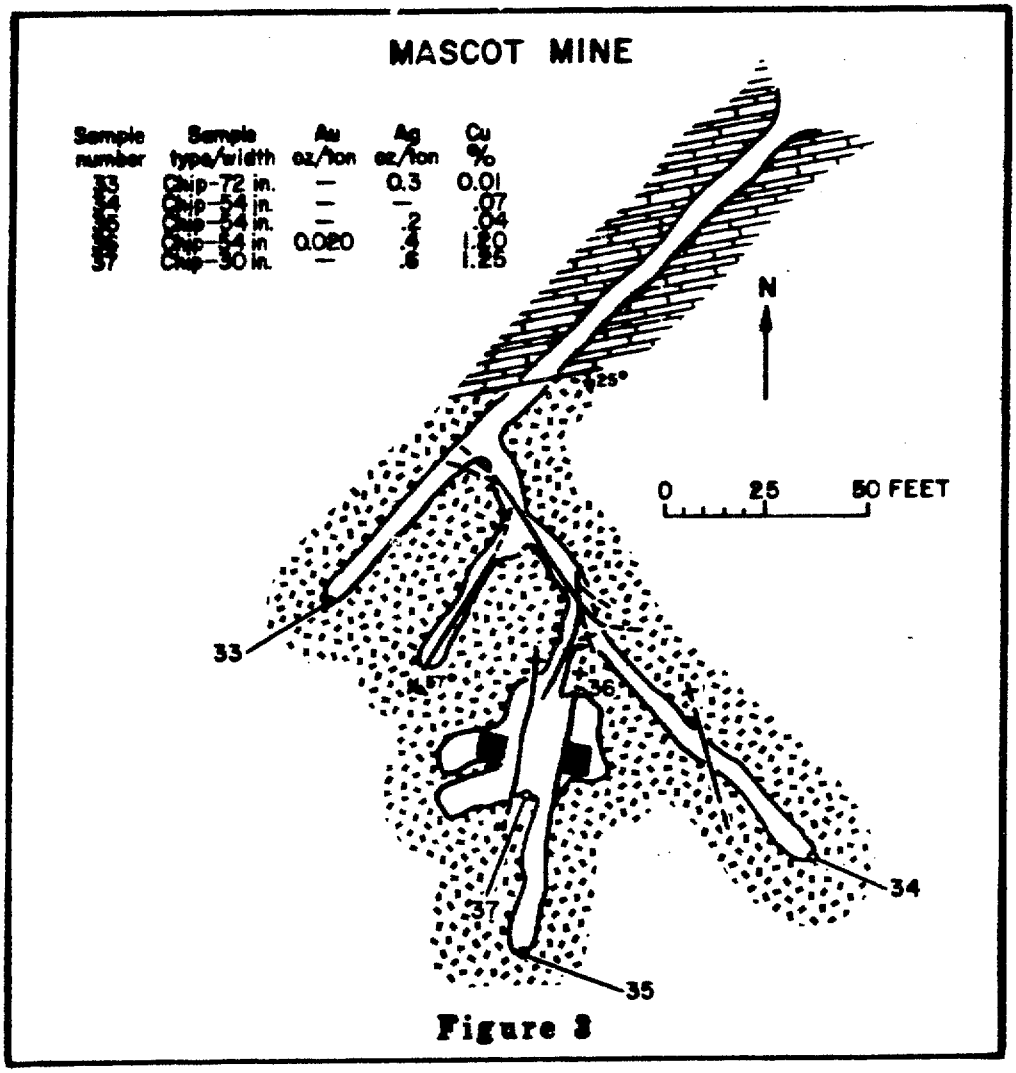
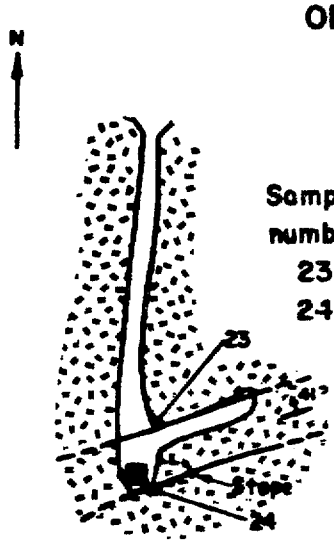

MASCOT MINE
Sample number
Sample type/width
Au oz/ton
Ag oz/ton
Cu %
Chip-72 in. — 0.3 0.01
.07
.04
.20
.25
Chip-30 in. — .8
N
125°
0 25 50 FEET
33
36
34
37
35

Figure 3

ADIT 1300 FT SOUTH OF NEVADA MINE



Sample number	Sample type/width	Au oz/ton	Ag oz/ton	Cu %
23	Chip–48 in.	—	0.4	0.48
24	Chip–48 in.	0.007	—	.16

0 25 50 FEET

Figure 4

TWO PEAKS MINE

Sample number	Sample type/width	Au oz/ton	Ag oz/ton	Cu %
29	Chip–36 in.	—	—	0.46
30	Chip–60 in.	—	0.2	.48
31	Chip–48 in.	—	—	.80
32	Chip–48 in.	—	.2	.50

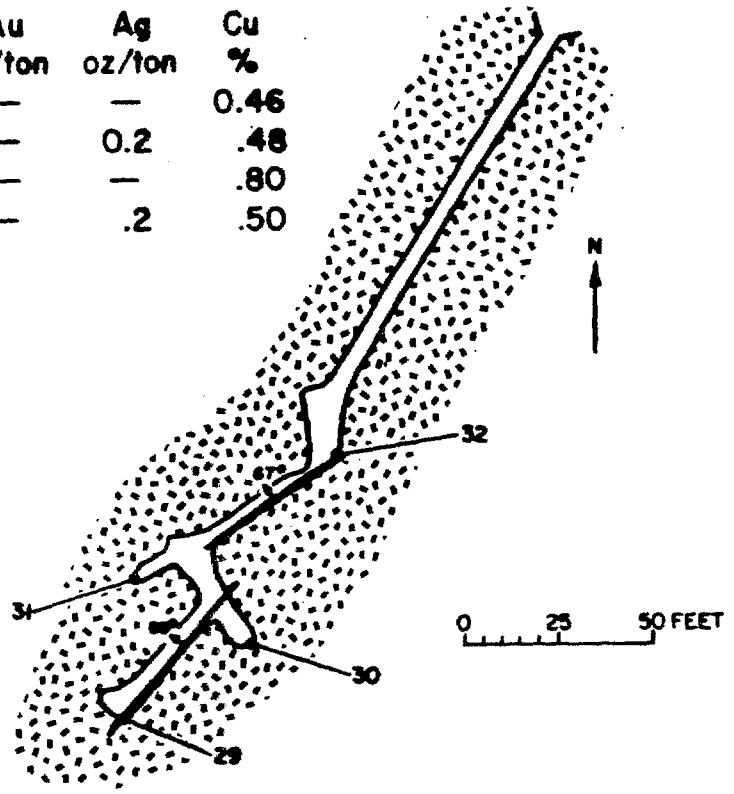
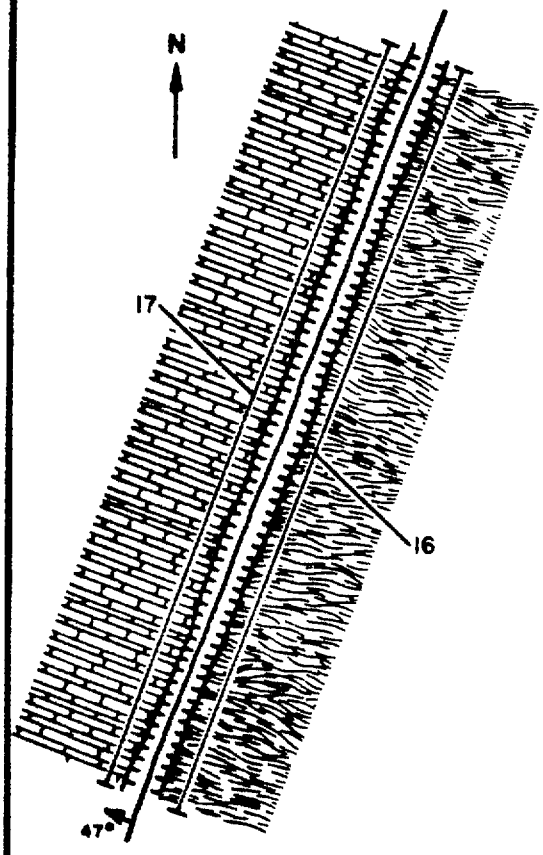


Figure 5

GOLD CRYSTAL MINE



Sample number	Sample type	Au oz/ton	Ag oz/ton
16	Random grab	0.02	0.1
17	Random grab	—	—

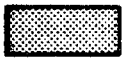
0 25 50 FEET

Figure 6

MAP EXPLANATION

APPROXIMATE BOUNDARY OF THE WHETSTONE RARE II FURTHER PLANNING AREA


PATENTED MINING CLAIMS


UNPATENTED MINING CLAIMS

SAMPLE LOCALITY SHOWING NUMBER

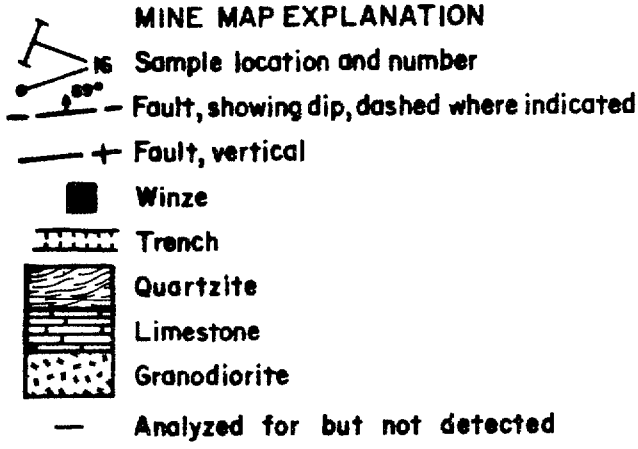

Prospect pit


Shaft


Mine

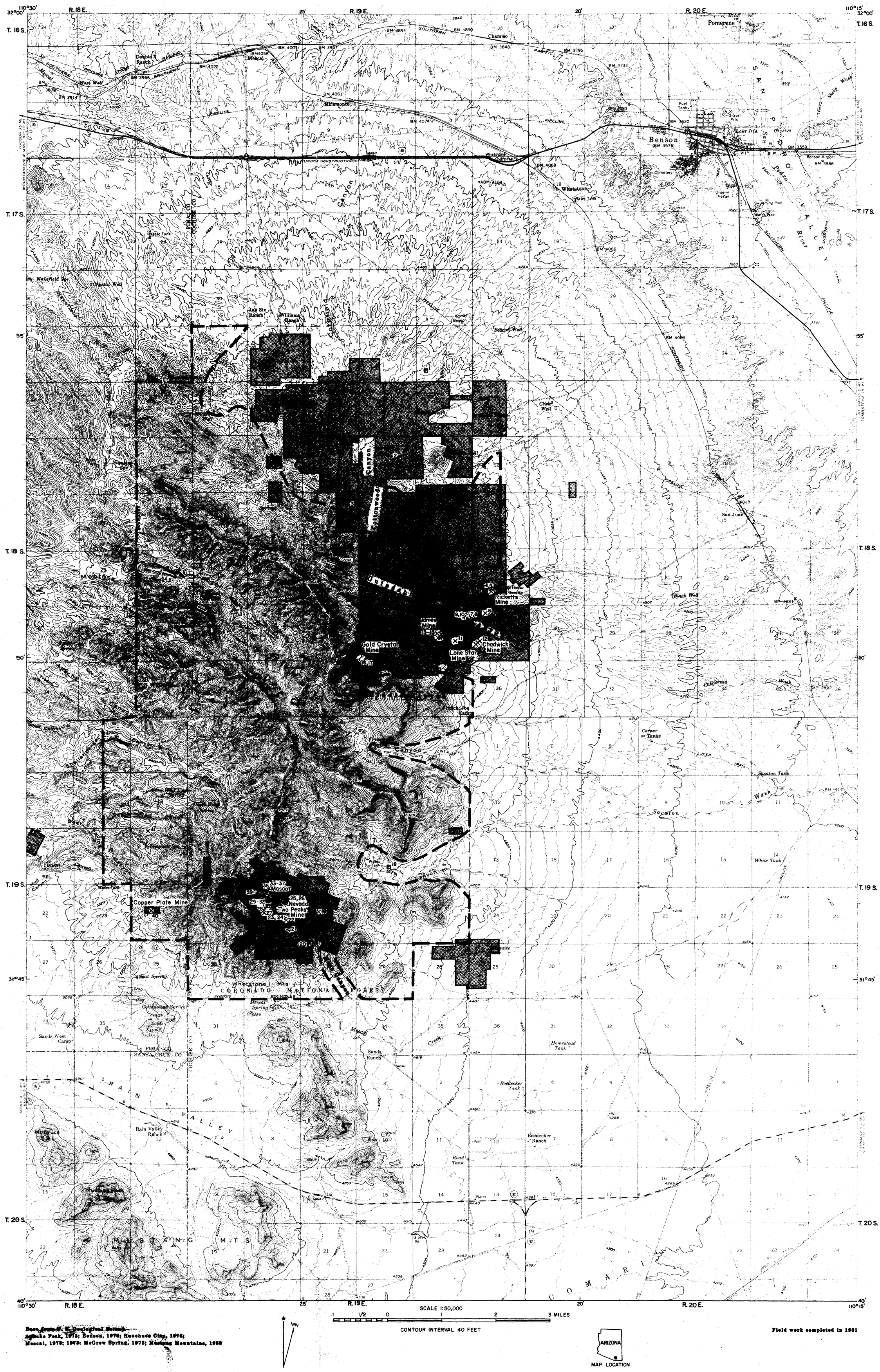

Adit


Trench


MINE MAP EXPLANATION
16
Sample location and number
Fault, showing dip, dashed where indicated
Fault, vertical
Winze
Trench
Quartzite
Limestone
Granodiorite
Analyzed for but not detected

DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

OPEN FILE REPORT
MLA 129-82
PLATE 1



SCALE 1:50,000
1 1/2 0 1 2 3 MILES
CONTOUR INTERVAL 40 FEET

Base from U. S. Geological Survey
Apache Peak, 1973; Benson, 1978; Huachuca City, 1978;
Mescal, 1978; 1973; McGrew Spring, 1973; Mustang Mountains, 1958

Field work completed in 1981

ARIZONA
MAP LOCATION

MINE AND PROSPECT MAP OF THE WHETSTONE ROADLESS AREA, COCHISE AND PIMA COUNTIES, ARIZONA

BY
ROBERT A. McCOLLY AND DAVID C. SCOTT, U. S. BUREAU OF MINES

1982